

**Appendix A
Building Demolition
Des Moines TCE Site
Des Moines, Iowa**

TABLE A-1						
COST SUMMARY						
Alternative	Option	Description	Capital Cost	Institutional Controls	Operation & Maintenance	Total
1E-05 RISK						
2A	NA	Building Demolition with Off-site Disposal (25% Hazardous)	\$ 15,246,000	\$ 55,000	\$ 2,663,000	\$ 17,964,000
2B	NA	Building Demolition with Off-site Disposal (75% Hazardous)	\$ 16,864,000	\$ 55,000	\$ 2,663,000	\$ 19,582,000
3	NA	Building Demolition with On-site Containment (25-75% Hazardous)	\$ 13,068,000	\$ 55,000	\$ 1,254,000	\$ 14,377,000

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ALTERNATIVE 2A
BUILDING DEMOLITION WITH OFF-SITE DISPOSAL (25% HAZARDOUS)

Table A-2				
Alternative 2A - Building Demolition with Off-site Disposal (25% Hazardous)				
Source	Description	Subtotal	Contingency	Total (Rounded)
Table A-3	Design and Construction	\$ 11,728,074	\$ 3,518,422.25	\$ 15,246,000
Table A-4	Institutional Controls	\$ 42,500	\$ 12,750	\$ 55,000
Table A-5	Operation and Maintenance	\$ 2,048,533	\$ 614,559.77	\$ 2,663,000
Contingency		30%	\$ 4,145,732.01	
Total			\$	17,964,000

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Capital Cost

Location factor (for zip code 433xx)

ECHOS	1
Get-a-Quote	1.04

Note: Location factor applied only to national average unit costs; not applied to local unit costs such as from vendors or Means.

Overhead and Profit (O&P)

General	25%	Typical general contractor overhead and profit
Means	-	NA
RACER	25%	NA
Contractor quote	5%	Prime contractor markup
Professional judgment	-	Not marked-up

Inflation

2.08%	Avg. annual inflation from 2010 to 2015
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Table A-3					
Alternative 2A - Building Demolition with Off-site Disposal (25% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Construction Subtotal				\$ 8,088,327
	Site Preparation				\$ 15,000
1	Temporary facilities	1.0	ls	\$ 15,000.00	\$ 15,000
	Asbestos Survey				\$ 8,703
2	Asbestos survey	1.0	ls	\$ 8,702.50	\$ 8,703
	Equipment Decontamination				\$ 81,685
3	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 69,645.00	\$ 69,645
4	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Asbestos Removal and Disposal				\$ 603,711
5	Asbestos removal - Office Building	1.0	ls	\$ 86,733.75	\$ 86,734
6	Asbestos removal - Production Building	1.0	ls	\$ 170,078.75	\$ 170,079
7	Asbestos removal - Building 1	1.0	ls	\$ 43,548.75	\$ 43,549
8	Asbestos removal - Building 2	1.0	ls	\$ 209,323.75	\$ 209,324
9	Asbestos removal - Building 3	1.0	ls	\$ 94,025.00	\$ 94,025
	PCB Removal and Disposal				\$ 330,886
10	PCB removal - Building 2	1.0	ls	\$ 81,773.75	\$ 81,774
11	PCB removal - Building 3	1.0	ls	\$ 133,537.50	\$ 133,538
12	PCB disposal	424.0	tons	\$ 272.58	\$ 115,574
	Metal Decontamination and Disposal				\$ 459,898
13	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 84,437.50	\$ 84,438
14	Load and haul (non-hazardous metal)	6,082.0	ton	\$ 21.46	\$ 130,537
15	Dump charges (non-hazardous metal)	6,082.0	ton	\$ 38.29	\$ 232,883
16	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Building Demolition				\$ 785,685
17	Building demolition - Office Building	1.0	ls	\$ 76,375.84	\$ 76,376
18	Building demolition - Production Building	1.0	ls	\$ 504,541.80	\$ 504,542
19	Building demolition - Building 1	1.0	ls	\$ 14,489.11	\$ 14,489
20	Building demolition - Building 2	1.0	ls	\$ 137,498.69	\$ 137,499
21	Building demolition - Building 3	1.0	ls	\$ 51,387.91	\$ 51,388
22	Building demolition - Walkway	1.0	ls	\$ 1,390.95	\$ 1,391

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Table A-3					
Alternative 2A - Building Demolition with Off-site Disposal (25% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Slab Demolition				\$ 529,227
23	Slab demolition - Office Building	1.0	ls	\$ 26,489.16	\$ 26,489
24	Slab demolition - Production Building	1.0	ls	\$ 241,586.65	\$ 241,587
25	Slab demolition - Building 1	1.0	ls	\$ 5,913.90	\$ 5,914
26	Slab demolition - Building 2	1.0	ls	\$ 56,116.11	\$ 56,116
27	Slab demolition - Building 3	1.0	ls	\$ 30,169.46	\$ 30,169
28	Slab demolition - Maintenance Building	1.0	ls	\$ 18,102.16	\$ 18,102
29	Slab demolition - Buildings 4 and 5	1.0	ls	\$ 150,849.76	\$ 150,850
	Waste Characterization				\$ 88,641
30	Sampling and analysis for pesticides, PCBs, and VOCs (building debris and wastewater)	1.0	ls	\$ 88,641.25	\$ 88,641
	Transportation and Disposal				\$ 3,129,157
31	Dump charges (non-hazardous waste)	39,896.0	ton	\$ 38.29	\$ 1,527,640
32	Load and haul (non-hazardous waste)	39,896.0	ton	\$ 21.46	\$ 856,282
33	Transportation and disposal (hazardous)	2,734.0	ton	\$ 272.58	\$ 745,235
	Capping				\$ 1,891,076
34	Asphalt pavement - 6 inch base course layer, 3 inch topping	40,463.0	sy	\$ 46.60	\$ 1,885,576
35	Cap material sampling and analysis (every 500 ft)	2.0	ea	\$ 2,000.00	\$ 4,000
36	Cap thickness verification (every 100 ft)	10.0	ea	\$ 150.00	\$ 1,500
	Crushing				\$ 103,212
37	Bulldozer (crushing non-hazardous debris for fill)	160.0	hour	\$ 267.40	\$ 42,784
38	Backhoe, 0.75 CY (crushing non-hazardous debris for fill)	160.0	hour	\$ 142.55	\$ 22,808
39	Jackhammer (crushing of non-hazardous debris for fill)	160.0	hour	\$ 235.13	\$ 37,620
	Measurement				\$ 61,446
40	Pre-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
41	Post-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
Construction subtotal				\$	8,088,327
Construction Contractor Mobe/Demobe, Site Prep and Submittals				10%	\$ 808,832.70
Pre-design investigation				10%	\$ 808,832.70
Engineering design				18%	\$ 1,455,898.86
Project management and construction oversight				7%	\$ 566,182.89
Capital Cost Subtotal				\$	11,728,074

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Table A-4					
Institutional Controls					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Institutional Controls Subtotal				\$ 42,500
42	Prepare LUC Implementation Plan (mid-level staff with senior review)	250	hr	\$ 110.00	\$ 27,500
43	Meetings with agencies (senior staff and attorneys)	60	hr	\$ 250.00	\$ 15,000

Operation and Maintenance

Table A-5					
Operation and Maintenance					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Annual Operation and Maintenance Subtotal				\$ 80,447
	Cap Monitoring				\$ 9,500
44	Engineer site visit (1 per year)	1.0	ls	\$ 3,500.00	\$ 3,500
45	Proj. Mgmt. 2 hrs/wk on proj for 24 weeks	48.0	hr	\$ 125.00	\$ 6,000
	Cap Repair				\$ 70,947
46	Seal coat	364,167.0	sf	\$ 0.17	\$ 62,382
47	Crack sealing	10,000.0	lf	\$ 0.86	\$ 8,565

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ALTERNATIVE 2B
BUILDING DEMOLITION WITH OFF-SITE DISPOSAL (75% HAZARDOUS)

Table A-6				
Alternative 2A - Building Demolition with Off-site Disposal (75% Hazardous)				
Source	Description	Subtotal	Contingency	Total (Rounded)
Table A-7	Design and Construction	\$ 12,972,345	\$ 3,891,703.58	\$ 16,864,000
Table A-8	Institutional Controls	\$ 42,500	\$ 12,750	\$ 55,000
Table A-9	Operation and Maintenance	\$ 2,048,533	\$ 614,559.77	\$ 2,663,000
Contingency		30%	\$ 4,519,013.34	
Total			\$	19,582,000

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Capital Cost

Location factor (for zip code 433xx)

ECHOS	1
Get-a-Quote	1.04

Note: Location factor applied only to national average unit costs; not applied to local unit costs such as from vendors or Means.

Overhead and Profit (O&P)

General	25%	Typical general contractor overhead and profit
Means	-	NA
RACER	25%	NA
Contractor quote	5%	Prime contractor markup
Professional judgment	-	Not marked-up

Inflation

2.08%	Avg. annual inflation from 2010 to 2015
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Table A-7					
Alternative 2A - Building Demolition with Off-site Disposal (75% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Construction Subtotal				\$ 8,946,445
	Site Preparation				\$ 15,000
1	Temporary facilities	1.0	ls	\$ 15,000.00	\$ 15,000
	Asbestos Survey				\$ 8,703
2	Asbestos survey	1.0	ls	\$ 8,702.50	\$ 8,703
	Equipment Decontamination				\$ 81,685
3	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 69,645.00	\$ 69,645
4	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Asbestos Removal and Disposal				\$ 603,711
5	Asbestos removal - Office Building	1.0	ls	\$ 86,733.75	\$ 86,734
6	Asbestos removal - Production Building	1.0	ls	\$ 170,078.75	\$ 170,079
7	Asbestos removal - Building 1	1.0	ls	\$ 43,548.75	\$ 43,549
8	Asbestos removal - Building 2	1.0	ls	\$ 209,323.75	\$ 209,324
9	Asbestos removal - Building 3	1.0	ls	\$ 94,025.00	\$ 94,025
	PCB Removal and Disposal				\$ 330,886
10	PCB removal - Building 2	1.0	ls	\$ 81,773.75	\$ 81,774
11	PCB removal - Building 3	1.0	ls	\$ 133,537.50	\$ 133,538
12	PCB disposal	424.0	tons	\$ 272.58	\$ 115,574
	Metal Decontamination and Disposal				\$ 459,898
13	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 84,437.50	\$ 84,438
14	Load and haul (non-hazardous metal)	6,082.0	ton	\$ 21.46	\$ 130,537
15	Dump charges (non-hazardous metal)	6,082.0	ton	\$ 38.29	\$ 232,883
16	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Building Demolition				\$ 785,685
17	Building demolition - Office Building	1.0	ls	\$ 76,375.84	\$ 76,376
18	Building demolition - Production Building	1.0	ls	\$ 504,541.80	\$ 504,542
19	Building demolition - Building 1	1.0	ls	\$ 14,489.11	\$ 14,489
20	Building demolition - Building 2	1.0	ls	\$ 137,498.69	\$ 137,499
21	Building demolition - Building 3	1.0	ls	\$ 51,387.91	\$ 51,388
22	Building demolition - Walkway	1.0	ls	\$ 1,390.95	\$ 1,391

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Table A-7					
Alternative 2A - Building Demolition with Off-site Disposal (75% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Slab Demolition				\$ 529,227
23	Slab demolition - Office Building	1.0	ls	\$ 26,489.16	\$ 26,489
24	Slab demolition - Production Building	1.0	ls	\$ 241,586.65	\$ 241,587
25	Slab demolition - Building 1	1.0	ls	\$ 5,913.90	\$ 5,914
26	Slab demolition - Building 2	1.0	ls	\$ 56,116.11	\$ 56,116
27	Slab demolition - Building 3	1.0	ls	\$ 30,169.46	\$ 30,169
28	Slab demolition - Maintenance Building	1.0	ls	\$ 18,102.16	\$ 18,102
29	Slab demolition - Buildings 4 and 5	1.0	ls	\$ 150,849.76	\$ 150,850
	Waste Characterization				\$ 88,641
30	Sampling and analysis for pesticides, PCBs, and VOCs (building debris and wastewater)	1.0	ls	\$ 88,641.25	\$ 88,641
	Transportation and Disposal				\$ 3,987,275
31	Dump charges (non-hazardous waste)	35,864.0	ton	\$ 38.29	\$ 1,373,252
32	Load and haul (non-hazardous waste)	35,864.0	ton	\$ 21.46	\$ 769,744
33	Transportation and disposal (hazardous)	6,766.0	ton	\$ 272.58	\$ 1,844,279
	Capping				\$ 1,891,076
34	Asphalt pavement - 6 inch base course layer, 3 inch topping	40,463.0	sy	\$ 46.60	\$ 1,885,576
35	Cap material sampling and analysis (every 500 ft)	2.0	ea	\$ 2,000.00	\$ 4,000
36	Cap thickness verification (every 100 ft)	10.0	ea	\$ 150.00	\$ 1,500
	Crushing				\$ 103,212
37	Bulldozer (crushing non-hazardous debris for fill)	160.0	hour	\$ 267.40	\$ 42,784
38	Backhoe, 0.75 CY (crushing non-hazardous debris for fill)	160.0	hour	\$ 142.55	\$ 22,808
39	Jackhammer (crushing of non-hazardous debris for fill)	160.0	hour	\$ 235.13	\$ 37,620
	Measurement				\$ 61,446
40	Pre-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
41	Post-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
Construction subtotal					\$ 8,946,445
Construction Contractor Mobe/Demobe, Site Prep and Submittals					\$ 894,644.50
Pre-design investigation					\$ 894,644.50
Engineering design					\$ 1,610,360.10
Project management and construction oversight					\$ 626,251.15
Capital Cost Subtotal					\$ 12,972,345

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Table A-8					
Institutional Controls					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Institutional Controls Subtotal				\$ 42,500
42	Prepare LUC Implementation Plan (mid-level staff with senior review)	250	hr	\$ 110.00	\$ 27,500
43	Meetings with agencies (senior staff and attorneys)	60	hr	\$ 250.00	\$ 15,000

Operation and Maintenance

Table A-9					
Operation and Maintenance					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Annual Operation and Maintenance Subtotal				\$ 80,447
	Cap Monitoring				\$ 9,500
44	Engineer site visit (1 per year)	1.0	ls	\$ 3,500.00	\$ 3,500
45	Proj. Mgmt. 2 hrs/wk on proj for 24 weeks	48.0	hr	\$ 125.00	\$ 6,000
	Cap Repair				\$ 70,947
46	Seal coat	364,167.0	sf	\$ 0.17	\$ 62,382
47	Crack sealing	10,000.0	lf	\$ 0.86	\$ 8,565

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ALTERNATIVE 3
BUILDING DEMOLITION WITH ON-SITE CONTAINMENT (25-75% HAZARDOUS)

Table A-10				
Alternative 3 - Building Demolition with On-site Containment (25-75% Hazardous)				
Source	Description	Subtotal	Contingency	Total (Rounded)
Table A-11	Design and Construction	\$ 10,051,952	\$ 3,015,585.74	\$ 13,068,000
Table A-12	Institutional Controls	\$ 42,500	\$ 12,750	\$ 55,000
Table A-13	Operation and Maintenance	\$ 964,698	\$ 289,409.34	\$ 1,254,000
Contingency		30%	\$ 3,317,745.07	
Total				\$ 14,377,000

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Capital Cost

Location factor (for zip code 433xx)

ECHOS

Get-a-Quote

1
1.04

Note: Location factor applied only to national average unit costs; not applied to local unit costs such as from vendors or Means.

Overhead and Profit (O&P)

General

Means

RACER

Contractor quote

Professional judgment

25%
-
25%
5%
-

Typical general contractor overhead and profit

NA

NA

Prime contractor markup

Not marked-up

Inflation

2.08%

Avg. annual inflation from 2010 to 2015

Table A-11					
Alternative 3 - Building Demolition with On-site Containment (25-75% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Construction Subtotal				\$ 6,932,381
	Site Preparation				\$ 15,000
1	Temporary facilities	1.0	ls	\$ 15,000.00	\$ 15,000
	Asbestos Survey				\$ 8,703
2	Asbestos survey	1.0	ls	\$ 8,702.50	\$ 8,703
	Equipment Decontamination				\$ 81,685
3	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 69,645.00	\$ 69,645
4	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Asbestos Removal and Disposal				\$ 603,711
5	Asbestos removal - Office Building	1.0	ls	\$ 86,733.75	\$ 86,734
6	Asbestos removal - Production Building	1.0	ls	\$ 170,078.75	\$ 170,079
7	Asbestos removal - Building 1	1.0	ls	\$ 43,548.75	\$ 43,549
8	Asbestos removal - Building 2	1.0	ls	\$ 209,323.75	\$ 209,324
9	Asbestos removal - Building 3	1.0	ls	\$ 94,025.00	\$ 94,025
	PCB Removal and Disposal				\$ 330,886
10	PCB removal - Building 2	1.0	ls	\$ 81,773.75	\$ 81,774
11	PCB removal - Building 3	1.0	ls	\$ 133,537.50	\$ 133,538
12	PCB disposal	424.0	tons	\$ 272.58	\$ 115,574
	Metal Decontamination and Disposal				\$ 417,294
13	Decontamination facilities (1,500 square feet)	1.0	ls	\$ 84,437.50	\$ 84,438
14	Load and haul (non-hazardous metal)	5,369.0	ton	\$ 21.46	\$ 115,234
15	Dump charges (non-hazardous metal)	5,369.0	ton	\$ 38.29	\$ 205,582
16	Transportation and disposal (2,750 gallons of wastewater)	1.0	ls	\$ 12,040.00	\$ 12,040
	Building Demolition				\$ 785,685
17	Building demolition - Office Building	1.0	ls	\$ 76,375.84	\$ 76,376
18	Building demolition - Production Building	1.0	ls	\$ 504,541.80	\$ 504,542
19	Building demolition - Building 1	1.0	ls	\$ 14,489.11	\$ 14,489
20	Building demolition - Building 2	1.0	ls	\$ 137,498.69	\$ 137,499
21	Building demolition - Building 3	1.0	ls	\$ 51,387.91	\$ 51,388
22	Building demolition - Walkway	1.0	ls	\$ 1,390.95	\$ 1,391

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Table A-11					
Alternative 3 - Building Demolition with On-site Containment (25-75% Hazardous)					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Waste Characterization				\$ 75,349
23	Sampling and analysis for pesticides, PCBs, and VOCs (building debris and wastewater)	1.0	ls	\$ 75,348.75	\$ 75,349
	Transportation and Disposal				\$ 2,068,843
24	Dump charges (non-hazardous waste)	34,623.0	ton	\$ 38.29	\$ 1,325,734
25	Load and haul (non-hazardous waste)	34,623.0	ton	\$ 21.46	\$ 743,109
	Asphalt Cap				\$ 541,799
26	Asphalt pavement - 6 inch base course layer, 3 inch topping (includes 0.9-2.6 feet debris foundation layer)	11,515.0	sy	\$ 46.60	\$ 536,599
27	Cap material sampling and analysis (every 500 ft)	2.0	ea	\$ 2,000.00	\$ 4,000
28	Cap thickness verification (every 100 ft)	8.0	ea	\$ 150.00	\$ 1,200
	Prescriptive Cap				\$ 1,683,950
29	Seeding, vegetative cover	3.7	ac	\$ 4,993.48	\$ 18,576
30	Topsoil, 6 inches deep	3,752.0	lcy	\$ 51.00	\$ 191,352
31	Fill, 6 inch lifts (includes delivery, spreading, and compaction)	11,257.1	cy	\$ 34.89	\$ 392,732
32	Sand, 6 inch lifts	6,604.2	cy	\$ 35.24	\$ 232,714
33	Clay, low permeability, 2 feet (includes 0.6-1.7 feet debris foundation layer)	16,811.0	cy	\$ 37.84	\$ 636,086
34	Geotextile fabric, non-woven 80 Mil	19,812.5	sy	\$ 2.40	\$ 47,550
35	60 Mil polymetric liner, high-density polyethylene	178,313.0	sf	\$ 0.93	\$ 164,940
	Crushing				\$ 258,030
36	Bulldozer (crushing debris for fill)	400.0	hour	\$ 267.40	\$ 106,960
37	Backhoe, 0.75 CY (crushing debris for fill)	400.0	hour	\$ 142.55	\$ 57,020
38	Jackhammer (crushing of debris for fill)	400.0	hour	\$ 235.13	\$ 94,050
	Measurement				\$ 61,446
39	Pre-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
40	Post-construction surveying	14.0	days	\$ 2,194.52	\$ 30,723
Construction subtotal					\$ 6,932,381
Construction Contractor Move/Demove, Site Prep and Submittals					\$ 693,238.10
Pre-design investigation					\$ 693,238.10
Engineering design					\$ 1,247,828.58
Project management and construction oversight					\$ 485,266.67
Capital Cost Subtotal					\$ 10,051,952

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Table A-12					
Institutional Controls					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Institutional Controls Subtotal				\$ 42,500
41	Prepare LUC Implementation Plan (mid-level staff with senior review)	250	hr	\$ 110.00	\$ 27,500
42	Meetings with agencies (senior staff and attorneys)	60	hr	\$ 250.00	\$ 15,000

Operation and Maintenance

Table A-13					
Operation and Maintenance					
Item	Description	Quantity	Unit	Unit Price (Incl. O&P)	Total Cost
	Annual Operation and Maintenance Subtotal				\$ 35,317
	Cap and Groundwater Monitoring				\$ 11,140
43	Groundwater sampling (included as part of semi-annual groundwater sampling for Operable Unit 4)	2.0	day	\$ -	\$ -
44	Sample analysis for pesticides (VOCs sampled during semi-annual groundwater sampling for Operable Unit 4)	20.0	ea	\$ 81.99	\$ 1,640
45	Monitoring annual report (included with semi-annual monitoring report for Operable Unit 4)	1.0	ls	\$ -	\$ -
46	Engineer site visit (1 per year)	1.0	ls	\$ 3,500.00	\$ 3,500
47	Proj. Mgmt. 2 hrs/wk on proj for 24 weeks	48.0	hr	\$ 125.00	\$ 6,000
	Cap Repair				\$ 24,177
48	Seal coat	103,635.0	sf	\$ 0.17	\$ 17,753
49	Crack sealing	7,500.0	lf	\$ 0.86	\$ 6,424

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Table A-14						
Present Value Analysis						
Year	Annual Discount Factor ²	Alternative 2A - Building Demolition with Off-site Disposal (25% Hazardous)				
		1E-5 Risk				
		Operation and Maintenance Costs				
	30-Yr	Description	Future Cost ³	Description	Future Cost ³	Present Value (2015)
0	1.000					\$0
1	0.985	Cap O&M	\$80,447			\$79,258
2	0.971	Cap O&M	\$80,447			\$78,087
3	0.956	Cap O&M	\$80,447			\$76,933
4	0.942	Cap O&M	\$80,447			\$75,796
5	0.928	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$97,882
6	0.915	Cap O&M	\$80,447			\$73,572
7	0.901	Cap O&M	\$80,447			\$72,485
8	0.888	Cap O&M	\$80,447			\$71,414
9	0.875	Cap O&M	\$80,447			\$70,358
10	0.862	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$90,860
11	0.849	Cap O&M	\$80,447			\$68,294
12	0.836	Cap O&M	\$80,447			\$67,285
13	0.824	Cap O&M	\$80,447			\$66,291
14	0.812	Cap O&M	\$80,447			\$65,311
15	0.800	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$84,342
16	0.788	Cap O&M	\$80,447			\$63,395
17	0.776	Cap O&M	\$80,447			\$62,458
18	0.765	Cap O&M	\$80,447			\$61,535
19	0.754	Cap O&M	\$80,447			\$60,625
20	0.742	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$78,291
21	0.731	Cap O&M	\$80,447			\$58,847
22	0.721	Cap O&M	\$80,447			\$57,977
23	0.710	Cap O&M	\$80,447			\$57,120
24	0.700	Cap O&M	\$80,447			\$56,276
25	0.689	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$72,675
26	0.679	Cap O&M	\$80,447			\$54,625
27	0.669	Cap O&M	\$80,447			\$53,818
28	0.659	Cap O&M	\$80,447			\$53,023
29	0.649	Cap O&M	\$80,447			\$52,239
30	0.640	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$67,461
Total Present Value of Periodic Cost						\$2,048,533

Notes:

1 From OMB Circular A-94 Appendix C, Updated November 2015

2 Annual discount factor = $1/(1+i)^t$, where i = discount rate (includes inflation and interest) and t = year

3 Current dollar cost of future event

O&M Operations and maintenance

Appendix A
Building Demolition
Des Moines TCE Site
Des Moines, Iowa

Table A-15						
Present Value Analysis						
Year	Annual Discount Factor ²	Alternative 2A - Building Demolition with Off-site Disposal (75% Hazardous)				
		1E-5 Risk				
		Operation and Maintenance Costs				
Year	30-Yr	Description	Future Cost ³	Description	Future Cost ³	Present Value (2015)
0	1.000					\$0
1	0.985	Cap O&M	\$80,447			\$79,258
2	0.971	Cap O&M	\$80,447			\$78,087
3	0.956	Cap O&M	\$80,447			\$76,933
4	0.942	Cap O&M	\$80,447			\$75,796
5	0.928	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$97,882
6	0.915	Cap O&M	\$80,447			\$73,572
7	0.901	Cap O&M	\$80,447			\$72,485
8	0.888	Cap O&M	\$80,447			\$71,414
9	0.875	Cap O&M	\$80,447			\$70,358
10	0.862	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$90,860
11	0.849	Cap O&M	\$80,447			\$68,294
12	0.836	Cap O&M	\$80,447			\$67,285
13	0.824	Cap O&M	\$80,447			\$66,291
14	0.812	Cap O&M	\$80,447			\$65,311
15	0.800	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$84,342
16	0.788	Cap O&M	\$80,447			\$63,395
17	0.776	Cap O&M	\$80,447			\$62,458
18	0.765	Cap O&M	\$80,447			\$61,535
19	0.754	Cap O&M	\$80,447			\$60,625
20	0.742	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$78,291
21	0.731	Cap O&M	\$80,447			\$58,847
22	0.721	Cap O&M	\$80,447			\$57,977
23	0.710	Cap O&M	\$80,447			\$57,120
24	0.700	Cap O&M	\$80,447			\$56,276
25	0.689	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$72,675
26	0.679	Cap O&M	\$80,447			\$54,625
27	0.669	Cap O&M	\$80,447			\$53,818
28	0.659	Cap O&M	\$80,447			\$53,023
29	0.649	Cap O&M	\$80,447			\$52,239
30	0.640	Cap O&M	\$80,447	Five-Year Review	\$25,000	\$67,461
Total Present Value of Periodic Cost						\$2,048,533

Notes:

- 1 From OMB Circular A-94 Appendix C, Updated November 2015
- 2 Annual discount factor = $1/(1+i)^t$, where i = discount rate (includes inflation and interest) and t = year
- 3 Current dollar cost of future event
- O&M Operations and maintenance

**Appendix A
Building Demolition
Des Moines TCE Site
Des Moines, Iowa**

Table A-16						
Present Value Analysis						
Year	Annual Discount Factor ²	Alternative 3 - Building Demolition with On-site Containment (25-75% Hazardous)				
	30-Yr	1E-5 Risk				
		Operation and Maintenance Costs				
		Description	Future Cost ³	Description	Future Cost ³	Present Value (2015)
0	1.000					\$0
1	0.985	Cap O&M	\$35,317			\$34,795
2	0.971	Cap O&M	\$35,317			\$34,281
3	0.956	Cap O&M	\$35,317			\$33,774
4	0.942	Cap O&M	\$35,317			\$33,275
5	0.928	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$55,990
6	0.915	Cap O&M	\$35,317			\$32,299
7	0.901	Cap O&M	\$35,317			\$31,822
8	0.888	Cap O&M	\$35,317			\$31,351
9	0.875	Cap O&M	\$35,317			\$30,888
10	0.862	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$51,973
11	0.849	Cap O&M	\$35,317			\$29,982
12	0.836	Cap O&M	\$35,317			\$29,539
13	0.824	Cap O&M	\$35,317			\$29,102
14	0.812	Cap O&M	\$35,317			\$28,672
15	0.800	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$48,245
16	0.788	Cap O&M	\$35,317			\$27,831
17	0.776	Cap O&M	\$35,317			\$27,420
18	0.765	Cap O&M	\$35,317			\$27,014
19	0.754	Cap O&M	\$35,317			\$26,615
20	0.742	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$44,784
21	0.731	Cap O&M	\$35,317			\$25,834
22	0.721	Cap O&M	\$35,317			\$25,453
23	0.710	Cap O&M	\$35,317			\$25,076
24	0.700	Cap O&M	\$35,317			\$24,706
25	0.689	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$41,571
26	0.679	Cap O&M	\$35,317			\$23,981
27	0.669	Cap O&M	\$35,317			\$23,627
28	0.659	Cap O&M	\$35,317			\$23,277
29	0.649	Cap O&M	\$35,317			\$22,933
30	0.640	Cap O&M	\$35,317	Five-Year Review	\$25,000	\$38,589
Total Present Value of Periodic Cost						\$964,698

Notes:

- 1 From OMB Circular A-94 Appendix C, Updated November 2015
 - 2 Annual discount factor = $1/(1+i)^t$, where i = discount rate (includes inflation and interest) and t = year
 - 3 Current dollar cost of future event
- O&M Operations and maintenance